Ionophore Toxicity in Horses

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Scenario: Your grandpa decides to give you a treat by purchasing horse feed for your two show horses. But, when he gets to the feed store, he finds out that your brand of feed is very expensive. He used a similar type mix for his cattle at about half the price, so he picks that up instead. He empties it into the large feed bin and heads home. The next morning, one horse is dead and the other is showing severe colic signs.

Ionophores are a class of antibiotics labeled for use in cattle, small ruminant, and poultry feed to slow the growth of intestinal coccidia and improve feed efficiency. While antibiotics fed to animals that are considered important for human health are now regulated under the Veterinary Feed Directive (VFD), and require the equivalent of a prescription from a veterinarian; ionophores are not used in humans and therefore, are not included under this rule. They may be purchased “over the counter” from any feed supplier. Commonly used products (and some brand names) include monensin (Coban, Rumensin), lasalocid (Bovatec), and salinomycin (Biocox, Saccox). Ionophores are absorbed in the digestive tract and when toxic amounts are ingested, the heart, skeletal muscle, and also the kidney and liver can be negatively affected. Horses are very susceptible to ionophore toxicity; the lethal dose is less than 1/10th of the amount that can be safely fed to cattle. For monensin, 2-3 mg/kg, or about 1 gram, is enough to poison a 1,000 lb. horse. For salinomycin, that amount decreases to 0.6mg/kg. Even a very small amount of an ionophore is enough to kill your horse.

Is my horse at risk?

Horses are usually exposed to ionophores by gaining access to medicated feed intended for cattle or poultry. This could be by unknowingly purchasing a product containing ionophores which is not intended for horses, or allowing ranch horses to eat with the cattle. Be sure to read all feed labels carefully. If ionophores are being fed to other animals on the property, take precautions to ensure horses cannot gain access to the feed or are not accidentally fed the medicated feed. Even exposure to poultry waste containing ionophores can cause issues with horses.

On occasion, mistakes in mixing or cleaning protocols at feed mills have happened, resulting in distribution of horse feed tainted with ionophores. These occurrences are rare, and reputable feed mills have protocols in place, which may even include separate equipment or facilities, to ensure this does not happen. The U.S. Food and Drug Administration introduced specific rules in 2011 to establish CGMP’s (Current Good Manufacturing Practices) and preventative controls for animal feed manufacturers. These animal feed regulations should decrease potential of feed mill errors.
**Treatment**

There is not a specific drug to reverse ionophore poisoning, but supportive care may help, depending on severity. This includes emptying the gastrointestinal tract by treating with mineral oil and activated charcoal, and using IV fluids to support heart output. Serious cases may require extensive nursing care including heart monitoring and antiarrhythmic drugs.

**Prevention**

Ionophore toxicity is a result of ingestion of the compound. Therefore, do not allow your horse to have any access to feed prepared for use in cattle, small ruminants, or poultry. Read feed bag labels carefully, if any ionophores have been added, the product and amount will be on the label. Do not buy or use “damaged” bagged feeds that don’t have a label. These feeds may be discounted, but the cost may end up being your horse’s life. If the toxicity is the result of errors from the feed manufacturer, there may be extensive legal implications for that company.

You should always maintain good records of feed provided to your horse, including labels and lot numbers. This will be valuable information in the case of a recall or suspected poisoning. Simply tearing off the entire label (including the lot number), marking it with the date you opened the bag, and placing it in your filing cabinet is one easy way to keep track of this information.

**Cattle Feed Label Examples**

Note that the drug monensin has been clearly marked on the labels below. These labels also include a “Caution” statement against feeding this feed to horses, however not all ionophore feed labels carry this warning. These example feed labels are courtesy of the University of Arizona Feedlot and Brice Tabor.
References and Further Reading


This information has been reviewed by University faculty.

extension.arizona.edu/pubs/az1758-2018.pdf

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